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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/712,314	11/13/2000	Thomas P. Glenn	G0026M	1964

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EXAMINER

CHAMBLISS, ALONZO

ART UNIT PAPER NUMBER

2827

DATE MAILED: 10/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/712,314

Applicant(s)

GLENN ET AL.

Examiner

Alonzo Chambliss

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26-29 is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-12, 15-19, 23 and 25 is/are rejected.
- 7) ☒ Claim(s) 6, 7, 13, 14, 20-22 and 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 2/20/01 and 5/30/02 were filed before the mailing date of the non-final rejection on 10/4/02. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

2. The formal drawings were received on 9/28/01 in Paper No. 3. These drawings have been approved by the examiner and drafterperson.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of **50 to 150** words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

4. The disclosure is objected to because of the following informalities: on page 32, the application serial numbers are missing for the applications listed between lines 1-10.

Appropriate correction is required.

Claim Objections

5. Claim 10 is objected to because of the following informalities: " window support " should be changed to -- window support layer -- to be consisted with the language used in the other claims. Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:
- The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
7. Claims 2, 8, 9, 11, and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
8. Claim 2 recites the limitation " a step up ring " in lines 1 and 2. There is insufficient antecedent basis for this limitation in the claim.
9. Claim 8 recites the limitation " a step up ring " in lines 1 and 2. There is insufficient antecedent basis for this limitation in the claim.
10. Claim 11 recites the limitation " a trace " in line 1. There is insufficient antecedent basis for this limitation in the claim.
11. Claim 14 recites the limitation " a step up ring " in line 2. There is insufficient antecedent basis for this limitation in the claim.

12. Claim 14 recites the limitation " a noncritical region " in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

14. Claims 1-4, 8-10, and 17-19, insofar as definite, are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Glenn (U.S. 5,352,852).

With respect to Claim 1, the examiner basis the rejection below in light of the device 5 in Fig. 1 rotated 180 degrees, wherein the integrated circuit device 10 (i.e. charge coupled device (CCD)) is now in the position of the transparent aperture cover 23 (i.e. window) originally taught by Glenn. Glenn teaches mounting a window (i.e. transparent aperture cover for the transmission of light) above an active area 14 (i.e. light sensitive cell) on a first surface 11 of a sensor device 10 (i.e. a device having a light sensitive integrated region (light sensitive cell) on a device such as a charge couple device that is used to convert an image light into an electrical signal) comprises a bond pad 32 (i.e. conductive pads) on the first surface 11 (see col. 1 lines 31-40, col. 2 lines 26-32, and col. 3 lines 29-63; Figs. 1 and 4). A step up ring 16 (i.e. substrate that is elevated a thickness above the first surface of the sensor device 10) is mounted above a portion of a noncritical region of the first surface 11, between the bond pad 32 and the active area

14. Electrically connecting a trace 33 (i.e. metallization that are used to transmit electrical signals) on the step up ring to the bond pad 32 (see col. 2 lines 11-14 and col. 4 lines 47-56; Figs. 1 and 4). Giving the teachings of the above process steps, claim 1 is clearly anticipated by Glenn.

With respect to Claim 2, Glenn teaches wherein said mounting the step up ring 16 comprises directly mounting the first surface of the 17 step up ring 16 to the noncritical region by underfill 22 (see Fig. 1). Giving the teachings of the above process steps, claim 2 is clearly anticipated by Glenn.

With respect to Claim 3, Glenn teaches wherein the step up ring 16 is mounted around the peripheral of the window 23 (see Fig. 1). Giving the teachings of the above process steps, claim 3 is clearly anticipated by Glenn.

With respect to Claim 4, Glenn teaches wherein the step up ring 16 comprises a central aperture 19. The window 23 is located adjacent the central aperture 19 (see Fig. 1). Giving the teachings of the above process steps, claim 4 is clearly anticipated by Glenn.

With respect to Claim 8, Glenn teaches wherein the mounting of the step up ring 16 comprises mounting a first surface 17 of the step up ring 16 to a portion of a window support layer 22 (i.e. which includes a window support layer comprises elements 21, 22, and 26) above the noncritical region (see Fig. 1). Giving the teachings of the above process steps, claim 8 is clearly anticipated by Glenn.

With respect to Claims 9 and 10, Glenn teaches wherein the window 23 is mounted above the active area 14 by the portion of the window support layer 22 (i.e.

which includes a window support layer comprises elements 21, 22, and 26) and the step up ring 16 (see Fig. 1). Giving the teachings of the above process steps, claims 9 and 10 are clearly anticipated by Glenn.

With respect to Claim 17, Glenn teaches mounting a window (i.e. transparent aperture cover for the transmission of light) above an active area 14 (i.e. light sensitive cell) of a sensor device 10 (i.e. a device having a light sensitive integrated region on a device such as a charge couple device that is used to convert an image light into an electrical signal) (see col. 1 lines 31-40, col. 2 lines 26-32, and col. 3 lines 29-63; Figs. 1 and 4). The first surface 17 of a step up ring 16 (i.e. substrate that is elevated a thickness above the first surface of the sensor device 10) is directly attached to the first surface 11 of the sensor device 10 by underfill 22, wherein the step up ring is mounted around the peripheral of the window 23 (see Fig. 1). Giving the teachings of the above process steps, claim 17 is clearly anticipated by Glenn.

With respect to Claim 18, Glenn teaches wherein the directly attaching the first surface 17 of the step up ring 16 to the first surface 11 of the sensor device 10 by adhesive 22 (i.e. underfill material) (see col. 2 lines 14-19 and col. 4 lines 57 and 58; Figs. 1 and 4). Giving the teachings of the above process steps, claim 18 is clearly anticipated by Glenn.

With respect to Claim 19, Glenn teaches wherein the sensor device 10 comprises a bond pad 32 on the first surface 11 of the sensor device 10, a noncritical region of the first surface 11 of the sensor device 10 being between the active area 14 and the bond pad 32. The directly attaching comprises directly attaching the first

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surface 17 of the step up ring 16 to the portion of the noncritical region (see Figs. 1 and 4). Giving the teachings of the above process steps, claim 19 is clearly anticipated by Glenn.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claims 5, 11, 12, 15, 16, 23, and 25 are rejected under 35 U.S.C. 103(a) as being obvious over Glenn (U.S. 5,867,368) and Bigler et al. (U. S. 4,760,440) as applied to claims 1, 4, and 17 in view of Nakamura et al. (U.S. 5,138,145).

The applied reference has a common assignee and inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it

constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

With respect to Claims 5 and 23, Glenn fails to disclose wherein the sensor device is one of a plurality of sensor devices integrally connected together in a wafer. However, Bigler discloses in the summary of the invention that a sensor device 24 is one of a plurality of sensor devices 24 each including a silicon substrate having an array of detectors in a package 10 (see col. 1 54-65; Fig. 1). Bigler doesn't explicitly disclose in the process of making the sensor devices 24 that these devices are integrally connected together in a wafer. With this in mind, Nakamura discloses a silicon substrate (wafer) with photo sensors 13 containing a plurality of CCD image sensors 12,

wherein the plurality of CCD image sensor are integrally connected together in a wafer (see col. 2 lines 32-45). Glenn, Bigler, and Nakamura all have substantially the same environment of an image sensor (i.e. CCD image sensor) attached to a substrate or base to form an image sensor device. Thus, before the process of dicing the image sensors taught by Nakamura they are integrally connected together and the end result of the dicing process would yield sliced image sensors placed side by side in a package as taught by Bigler. Therefore, one skilled in the art would readily recognize incorporating a plurality of CCD image sensors with the device of Glenn, since the plurality of sensor devices would permit detecting larger object areas with the present of the plurality of images sensors as taught by Bigler.

With respect to Claim 11, the examiner basis the rejection below in light of the device 10 in Fig. 1 rotated 180 degrees, wherein the cover 36 is now in the position of the base plate 12 originally taught by Bigler. Bigler discloses electrically connecting a trace 18 (i.e. conductive lines providing electrical current between elements) on the step up ring 12 (i.e. base plate) to bond pad comprises wire bonding the trace 18 to the bond pad with a bond wire 28 (see Fig. 1). In a wire bonding process a bond pad also known as a conductive pad is present on a semiconductor device (i.e. image sensor) to provide the electrical connection between the semiconductor device and the bond wire.

With respect to claim 12, Bigler discloses forming a package body 36 to enclose the bond wire 28 (see Fig. 1).

With respect to Claim 15, Glenn discloses a CCD that is a sensor device (i.e. a device having a light sensitive integrated region (light sensitive cell) on a device such as

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a charge couple device that is used to convert an image light into an electrical signal). Glenn does not explicitly teach that the sensor device is an image sensor. However, Bigler discloses that a CCD is a solid-state image sensor (see col. 1 lines 4-7 and 54-65).

With respect to Claim 16, Bigler discloses a CCD image sensor wherein the active area (i.e. area that receives the radiation) is responsive to radiation (see col. 1 lines 10-12).

With respect to Claim 25, Nakamura discloses a process of singulating (i.e. dicing) a wafer substrate to form individual CCD image sensors (see col. 2 line 32-45).

Allowable Subject Matter

17. Claims 26-29 are allowed.

18. Claim 6, 7, 13, 14, 20-22, and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach the combination of a step up ring being one of plurality of step up rings integrally connected together in a sheet, wherein the first surface of the sheet is mounted on the first surface of the wafer in claims 6 and 24.

A step up ring comprising a central aperture, wherein the central aperture formed in the step up ring is filled with an encapsulant to form a package body in claim 13.

Electrically connecting the bond pad on a sensor device to an electrically conductive trace on the second surface of the step up ring in claim 20.

Mounting a window above an active area of an image sensor by a single window support layer having a first surface in contact with a first surface of an image sensor substrate with an image sensor. Directly attaching a first surface of a step up ring to a second surface of the window support layer, wherein the step up ring being mounted around the window in claim 26.

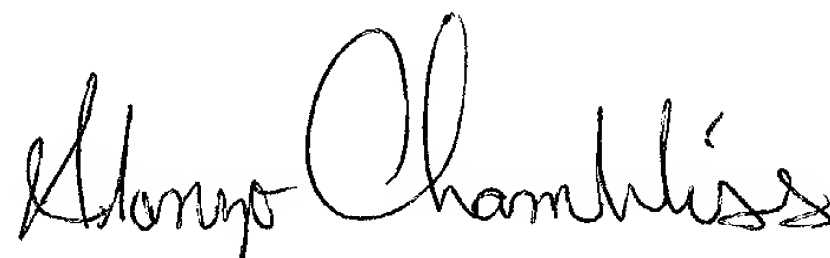
The prior art made of record and not relied upon is cited primarily to show the process of the instant invention.

Conclusion

19. Any inquiry concerning the communication or earlier communications from the examiner should be directed to Alonzo Chambliss whose telephone number is (703) 306-9143. The fax phone number for this Group is (703) 308-7722 or 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956.

AC/October 4, 2002



Alonzo Chambliss
Examiner
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